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In re Pro Se application of: Mario Rabinowitz and David Overhauser

Serial No. : 10/786,665 Filed: Feb. 25, 2004.

Title: Manufacture of and Apparatus for Nearly Frictionless Operation of a
Rotatable Array of Micro-Mirrors in a Solar Concentrator Sheet

Examiner: Tuyen Tra; Art. Unit: 2873; ph. 571, 272-2343

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Number of pages: 12 pages.

Dated: Nov. 16, 2004.

By Mario Rabinowitz

Mario Rabinowitz phone & FAX 650, 368-4466; Mario715@earthlink.net

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By Mario Rabinowitz
Mario Rabinowitz

Amendment

In The United States Patent And Trademark Office

In re Pro Se application of: Mario Rabinowitz and David Overhauser
Serial No. : 10/786,665 Filed: Feb. 25, 2004.
Title: Manufacture of and Apparatus for Nearly Frictionless Operation of a
Rotatable Array of Micro-Mirrors in a Solar Concentrator Sheet
Examiner: Tuyen Tra; Art. Unit: 2873; ph. 571, 272-2343

Honorable Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Nov. 16, 2004

Sir:

Applicant is responding to the Action by Examiner Tuyen Tra of Oct. 12, 2004, mailed Oct. 18, 2004.

I. General Remarks

Specular reflection by embedded mirrored in the balls is unique in our invention. "Specular reflection" is a commonly used term in optics and elsewhere. Specular reflection is standardly understood to occur from a "planar mirror" as taught in our invention and shown in our figures, in which the angle of reflection is equal to the angle of incidence of a light ray relative to a line perpendicular to the macroscopic reflecting surface, and the rays lie in the same plane with it. Thus the reflected light ray travels in a definite predictable and focusable direction.

Mirrors embedded in balls are not part of the cited Engler et al., Sheridan et al., and Jacobson patents relied upon by Examiner Tra. These patents utilize diffuse reflection in which the light cannot be aimed or focused as in our invention because it is reflected in a multiplicity of directions. They want their

light to be scattered in all directions because this gives a broad viewing angle for their displays. Nor is there a solar concentrator in the Jacobson patent. We feel that our unique invention is neither obvious, nor anticipated by the prior art.

II. Specific Responses to Points Raised in Office Action Mailed Oct. 18, 2004

The subject numbers used here correspond to those of Examiner Tra's Action. I quote his relevant statements and give our replies.

1. "The drawings filed on 02/25/2004 are considered formal by the examiner."

Applicants are glad that Examiner Tra finds that our drawings are acceptable.

2. Quotation of 35 U.S.C. 102 (b): Prior Publication

3. "Claims 1, 3, 4, 5, 7, 8 are rejected under 35 U.S.C. 102 (b) as being anticipated by Engler et al (U.S. Pat. 6,521,145 B1)."

Applicants respectfully disagree. Engler et al does not anticipate these claims for many reasons.

a) The word mirror (or any variation of it) does not occur in Engler. His particle 418 is not a rotatable mirrored ball. Nor can 418 function as a mirror. Reflection from 418 is diffuse such as from paper, a wall, a desk, etc., and not at all specular as from a mirror. Reflection from the mirrored balls in our invention is specular. As explained in paragraph 2 of the Background section of our specification, "On the contrary, diffuse reflection needs to be increased from the balls so the Gyricon display may easily be observed from all angles." Diffuse reflection is needed for the displays of the prior art.

b) Although Engler's fluid is a dielectric lubricant, it does not have to match the index of refraction of the surrounding material. In the detailed description of Fig. 1, paragraph 2 of our specification, we teach:

"It is preferable to utilize a liquid 18 whose index of refraction matches the clear hemisphere or clear hemicylinder, and it should have the same density as element 1 to minimize buoyant forces. The index of refraction of the sheet 17,

the liquid 18, and the optically transmissive upper portion of elements 1 should all be approximately equal." This is crucial for us because of specular reflection, but clearly not important to Engler et al because they use diffuse reflection.

Neither the term "index of refraction" nor the words "index," "refraction" separately occur in Engler. We use the term "index of refraction" both in the specification and in Claim 14:

"Claim 14. The method according to claim 9, wherein the index of refraction of at least one of the fluids approximately matches that of said sheet."

4. "Claims 9, 10, 12-18 and 20-23 are rejected under 35 U.S.C. 102 (b) as being anticipated by Sheridan et al. (U.S. PAT. 5,982,346 A)."

Applicants respectfully disagree. Sheridan et al does not anticipate these claims for many reasons.

a) "With respect to claim 9, Sheridan ...the mirrored balls (item 1545)...."

Sheridan does not have mirrored balls. The color planes inside the balls are not mirrors, they are colors such as red, orange, blue, yellow, green, , indigo, violet, cyan, magenta, pink, brown, or beige for color mixing. The word mirror never occurs together with the word ball, but occurs only once in the entire patent. An external mirror 1503 is mentioned in Fig. 15A, in paragraph 2, "Laser light for the image is produced by scanning laser 1502 in conjunction with mirror 1503 and lens 1504, in a manner like that used in known laser printing and digital xerographic techniques."

b) "With respect to claim 10, Sheridan ... eliminatable tray (item 1538) ..."

Sheridan et al does not use the word "eliminatable" or any synonym of it in their patent, as they use a "holding platform 1538" which is permanent and separate from their completed device. They say in Fig. 15C, in paragraph 1, "A section 1542 of partially cured elastomer from receiving surface 1530, onto which the colored ball image has been transferred from storage drum 1525, has been

removed to a holding platform 1538 and placed between retaining walls 1539a, 1539b as shown. "

We say in the detailed description of Fig.2, in paragraph 1 "The tray 4 holds the elements 1 in place during curing, and is preferably dissolved in the process."

Since Sheridan et al is not a solar concentrator, we have amended base claims 9, 5, and 1 to specify a solar concentrator

c) The fluid is dielectric. However, Sheridan et al is not a solar concentrator. We have amended base claims 9, 5, and 1 to specify a solar concentrator

d) "... index of refraction ... fluid ... matches sheet. (610);" Yes, but Sheridan et al is not a solar concentrator. The instant invention reflects light specularly with micro-mirrors embedded in balls for solar energy concentration, and Sheridan et al does neither of these things. We have amended base claims 1, 5, and 9 to specify a solar concentrator.

"...density of at least one of the fluid approximately matches that of the mirrored balls," We have already established in a) that the balls are NOT mirrored. We could find no statement that the fluid density approximately matches that of their balls in Sheridan et al.. Nevertheless, we have amended base claims 1, 5, and 9 to specify a solar concentrator.

"... fluid is lubricated." We could find no occurrence of any variation of the word "lubricate" in Sheridan et al. Nevertheless, we have amended base claims 1, 5, and 9 to specify a solar concentrator.

"... infiltrating fluids is vaporously removed;" We could find no occurrence of such a statement or of any words related to "vapor." Nevertheless, we have amended base claims 1, 5, and 9 to specify a solar concentrator.

"... wherein the volume of the material of the sheet (610) to the volume of the mirrored balls is greater than a factor of 2 (col.9 lines 35 -39)." No such statement or even remotely similar statement appears in col.9 lines 35 -39, nor anywhere in Sheridan et al. Their balls are not mirrored. The word "volume" does not occur anywhere in their patent. The word "factor" as in "factor of 2" does not occur anywhere in their patent. They only refer to physical factors. Nevertheless, we have amended base claims 1, 5, and 9 to specify a solar concentrator; and amended dependent claim 18 to make it more acceptable.

d) "... wherein the mirrored balls (1545) are precoated .;" The balls are not mirrored, and we could not find the word "precoat" or "precoated" in Sheridan et al. Nevertheless, we have amended base claims 1, 5, and 9 to specify a solar concentrator.

"herein the mirrored balls are asymmetrically closer to the top of the sheet (610) than to the bottom;" The balls are not mirrored, and we could not find any variation of the word "asymmetrical" in Sheridan et al. Nor could we find any statement that the balls are closer to the top of the sheet. Nevertheless, we have amended base claims 1, 5, and 9 to specify a solar concentrator.

"wherein the sheet is constructed of "laminar film." We could not find any variation of the word "laminar" in Sheridan et al. Nor does the word "film" occur in the description of their invention. Nevertheless, we have amended base claims 1, 5, and 9 to specify a solar concentrator.

5. Quotation of 35 U.S.C. 103 (a): Obviousness

6. "Claims 2 and 6 are rejected" We have already established in 4 a) that Engler's balls are NOT mirrored.

"... Jacobson ... solar cell concentrator."

Jacobson briefly mentions a "solar cell," but he nowhere mentions a "solar cell concentrator" or "solar concentrator." The word "concentrator" does not occur

in Jacobson, nor any variation of it. We say in our Definitions section:

"'Concentrator' as used herein in general is a micro-mirror system for focusing and reflecting light. In a solar energy context, it is that part of a Solar Collector system that directs and concentrates solar radiation onto a solar Receiver."

7. [6.] "Claim 19 is rejected holding the mirrored balls ... surrounding the rotatable mirrored balls ..." Neither Engler nor Sheridan have "mirrored" balls as previously established. No variation of the word "mirror" occurs in either patent.

None of the cited references, Engler, Sheridan, or Jacobson deal with a "solar concentrator. We have amended base claims 1, 5, and 9 to specify a solar concentrator.

8. "Claims 11 and 24 ... would be allowable"

We thank Examiner Tra for indicating that claims 11 and 24 would be allowable. We have amended the base claims 1, 5, and 9, and in view of the great differences between our invention and the cited references, we think that claims 11 and 24 are presently allowable.

III. Amendment of Claims

Applicants have amended claims to further distinguish them from the cited references in accord with Examiner Tra's findings, and in keeping with their consciences as explained in the above responses to the Office Action. Two claims, namely Claims 2 and 6 are cancelled.